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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/670,173	09/23/2003	Giovanni Moselli	02-NP-182/DP	2228

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EXAMINER	
NORTON, JENNIFER L	
ART UNIT	**PAPER NUMBER**
2121	

DATE MAILED: 12/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/670,173	MOSELLI ET AL.	
	Examiner	Art Unit	
	Jennifer L. Norton	2121	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 October 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *26 October 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. The following is a 2nd Non-Final Office Action in response to the Amendment received on October 26, 2005. Claims 1-20 are pending.

Priority

2. It is noted that this application appears to claim subject matter disclosed in prior Application No. 02425609.1, filed October 9, 2002. A reference to the prior application must be inserted as the first sentence(s) of the specification of this application or in an application data sheet (37 CFR 1.76), if applicant intends to rely on the filing date of the prior application under 35 U.S.C. 119(e), 120, 121, or 365(c). See 37 CFR 1.78(a). For benefit claims under 35 U.S.C. 120, 121, or 365(c), the reference must include the relationship (i.e., continuation, divisional, or continuation-in-part) of all nonprovisional applications. If the application is a utility or plant application filed under 35 U.S.C. 111(a) on or after November 29, 2000, the specific reference to the prior application must be submitted during the pendency of the application and within the later of four months from the actual filing date of the application or sixteen months from the filing date of the prior application. If the application is a utility or plant application which entered the national stage from an international application filed on or after November 29, 2000, after compliance with 35 U.S.C. 371, the specific reference must be submitted during the pendency of the application and within the later of four months from the date on which the national stage commenced under 35 U.S.C. 371(b) or (f) or sixteen months from the filing date of the prior application. See 37 CFR 1.78(a)(2)(ii) and (a)(5)(ii). This time period is not extendable and a failure to submit the reference

required by 35 U.S.C. 119(e) and/or 120, where applicable, within this time period is considered a waiver of any benefit of such prior application(s) under 35 U.S.C. 119(e), 120, 121 and 365(c). A benefit claim filed after the required time period may be accepted if it is accompanied by a grantable petition to accept an unintentionally delayed benefit claim under 35 U.S.C. 119(e), 120, 121 and 365(c). The petition must be accompanied by (1) the reference required by 35 U.S.C. 120 or 119(e) and 37 CFR 1.78(a)(2) or (a)(5) to the prior application (unless previously submitted), (2) a surcharge under 37 CFR 1.17(t), and (3) a statement that the entire delay between the date the claim was due under 37 CFR 1.78(a)(2) or (a)(5) and the date the claim was filed was unintentional. The Director may require additional information where there is a question whether the delay was unintentional. The petition should be addressed to: Mail Stop Petition, Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

If the reference to the prior application was previously submitted within the time period set forth in 37 CFR 1.78(a), but not in the first sentence(s) of the specification or an application data sheet (ADS) as required by 37 CFR 1.78(a) (e.g., if the reference was submitted in an oath or declaration or the application transmittal letter), and the information concerning the benefit claim was recognized by the Office as shown by its inclusion on the first filing receipt, the petition under 37 CFR 1.78(a) and the surcharge under 37 CFR 1.17(t) are not required. Applicant is still required to submit the reference in compliance with 37 CFR 1.78(a) by filing an amendment to the first sentence(s) of the specification or an ADS. See MPEP § 201.11.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1, 9, 12-16, and 18 are rejected under 35. U.S.C 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

5. Claim 1 recites the limitations:

a. "the deviation" in lines 1-2

b. "the value" in line 2

c. "the arrangement" in lines 3-4

d. "the estimation" in line 5

e. "the actual value" in line 11

There is insufficient antecedent basis for this limitation in the claim.

6. Claim 9 recites the limitation "the deviation" in line 2. There is insufficient antecedent basis for this limitation in the claim.

7. Claim 12 recites the limitation "the voltage" in line 2. There is insufficient antecedent basis for this limitation in the claim.

8. Claim 13 recites the limitations:

   a. "the group" in line 2

   b. "the current" in line 4

   c. "the quantity of air" in line 5

   d. "the temperature" in line 6

   There is insufficient antecedent basis for this limitation in the claim.

9. Claims 2-8, and 10-11 are rejected to because of their dependency on claim 1.

10. Claim 13 recites the limitations:

   a. "the group" in line 2

   b. "the current" in line 4

   c. "the quantity" in line 5

   d. "the temperature" in line 6

   There is insufficient antecedent basis for this limitation in the claim.

11. Claim 14 recites the limitation:

   a. "the deviation" in lines 1-2

   b. "the value measured" in line 2

   c. "the value estimated" in line 2

   d. "the estimation" in line 5

   There is insufficient antecedent basis for this limitation in the claim.

12. Claim 15 recites the limitation "the actual value" in line 2. There is insufficient antecedent basis for this limitation in the claim.

13. Claim 16 recites the limitation "the actual value" in line 2. There is insufficient antecedent basis for this limitation in the claim.

14. Claim 18 recites the limitations:

a. "the deviation" in line 2

b. "the difference" in line 2

c. "the current value" in line 2

d. "the respective mean value" in lines 2-3

There is insufficient antecedent basis for this limitation in the claim.

15. Claims 17 and 19-20 are rejected to because of their dependency on claim 1.

Claim Rejections - 35 USC § 102

16. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

17. Claim 1-7, 9-10 and 14-19 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No.: 5,197,114 (hereinafter Skeirik).

18. As per claim 1, Skeirik discloses an arrangement for controlling a system according to the deviation between the value measured on the system and the value estimated by means of a model of the controlled system of at least one control parameter, the arrangement comprising:

a neural network (col. 10, lines 61-65 and Fig. 12, element 1206), which generates the estimation (Fig. 1, element 1218) of said control parameter (col. 7, lines 32-34 and Fig. 20, element 2002) implementing said model as a function of a set of characteristic parameters of the controlled system and of respective configuration parameters of the neural network (col. 9, lines 7-11), said neural network having associated thereto a training module (Fig. 34), which can train said neural network by modifying said configuration parameters according to a set of updating data (col. 13, lines 1-13 and 24-31);

an acquisition module (Fig. 12, element 1226) for acquiring the actual value (Fig. 34, element 1220), as measured on the controlled system, of a set of sensing parameters (col. 8, line 68 and col. 9, lines 1-2) comprising at least one from among said control parameter 2002 and said characteristic parameters 2002 of the controlled system; and

a variation module (Fig. 34, element 3404), which is sensitive to the variation of said control parameter and is able to generate an update-enable signal (col. 21, lines 53-57) when said control parameter falls outside a pre-set tolerance range (col. 21, lines 32-39),

said acquisition module being sensitive to said update-enable signal for transferring to said training module, as said updating-data set, said set of sensing parameters (col. 9, lines 12-13).

19. As per claim 2, Sheirik discloses a truncation module for truncating the actual value of at least some of said characteristic parameters of the controlled system (col. 21, lines 41-43).

20. As per claim 3, Sheirik discloses a memory for storage (Fig. 12, element 1210) of at least one of the parameters of said set of sensing parameters (col. 16, lines 14-16).

21. As per claim 4, Sheirik discloses a functional module (Fig. 8, elements 808-814) for generating, according to the value of at least one of said characteristic parameters of the controlled system an address for storing said at least one control parameter (col. 20, lines 50-54).

22. As per claim 5, Sheirik discloses an input network (Fig. 32, elements 3212, 3214, and 3216) for verifying whether said actual value, as measured on said controlled system, of at least one of said characteristic parameters of the controlled system falls within an allowed range of variation (col. 21, lines 32-39).

23. As per claim 6, Sheirik discloses a sample-and-hold module (Fig. 12, element 1210) for acquiring the value of said control parameter (col. 16, lines 12-16).

24. As per claim 7, Sheirik discloses a restore module for restoring at least one parameter of the controlled system when said control parameter falls outside said pre-set tolerance range (col. 21, lines 53-57).

25. As per claim 9, Sheirik discloses the variation module is configured to detect the deviation (Fig. 32, element 3216), with respect to said tolerance range, of the difference between the current value of said control parameter and the respective mean value (col. 21, lines 47-52).

26. As per claim 10, Sheirik discloses the variation module is configured for operating according to a plurality of values of said control parameter, by detecting when a given number of said values of said control parameter falls outside said pre-set tolerance range (col. 21, lines 32-39 and 53-57).

27. As per claim 14, Sheirik discloses a method for controlling a system according to the deviation between the value measured on the system and the value estimated by means of a model of the controlled system of at least one control parameter, the method comprising:

generating the estimation (Fig. 1, element 1218) of said control parameter implementing said model as a function of a set of characteristic parameters (col. 7, lines 32-34 and Fig. 20, element 2002) of the controlled system and of respective configuration parameters (col. 9, lines 7-11);

modifying said configuration parameters according to a set of updating data (col. 13, lines 1-13 and 24-31);

acquiring an actual value (Fig. 34, element 1220), as measured on the controlled system, of a set of sensing parameters (col. 8, lines 68 and col. 9, lines 1-2) comprising at least one from among said control parameter and said characteristic parameters of the controlled system (col. 9, lines 7-13 and col. 16, lines 8-12);

and generating an update-enable signal when said control parameter falls outside a pre-set tolerance range (col. 21, lines 32-39 and 53-57 and col. 9, lines 12-13).

28. As per claim 15, Sheirik discloses truncating the actual value of at least some of said characteristic parameters of the controlled system (col. 21, lines 41-43).

29. As per claim 16, Sheirik discloses verifying whether the actual value, as measured on said controlled system, of at least one of said characteristic parameters of the controlled system falls within an allowed range of variation (col. 21, lines 32-39).

30. As per claim 17, Sheirik discloses restoring at least one parameter of the controlled system when said control parameter falls outside said pre-set tolerance range (col. 21, lines 53-57).

31. As per claim 18, Sheirik discloses detecting the deviation, with respect to said tolerance range, of the difference between the current value of said control parameter and the respective mean value (col. 21, lines 47-52).

32. As per claim 19, Sheirik discloses operating according to a plurality of values of said control parameter, by detecting when a given number of said values of said control parameter falls outside said preset tolerance range (col. 21, lines 30-39 and 53-57).

Claim Rejections - 35 USC § 103

33. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

34. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sheirik in view of U.S. Patent No.: 5,165,010 (hereinafter Masuda).

35. As per claim 8, Sheirik does not expressly teach the variation module comprising of a timer with a count which can be activated when said control parameter falls outside said pre-set tolerance range and wherein said variation module is configured for emitting said update-enable signal when, once the count of said timer is through, said control parameter remains outside said

pre-set tolerance range.

Masuda teaches to the use of a controller to force functional circuits (Fig. 2) to become activated when said control parameter falls outside said pre-set tolerance range and wherein said variation module is configured for emitting said update-enable signal when, once the count of said timer is through, said control parameter remains outside said pre-set tolerance range (col. 10, lines 67-68 and col. 11, lines 1-38).

Therefore, it would be obvious to a person of ordinary skill in the art at the time of the applicant's invention to modify the teaching of Sheirik to include the circuit of Masuda to implement a timer with a count which can be activated when said control parameter falls outside said pre-set tolerance range and wherein said variation module is configured for emitting said update-enable signal when, once the count of said timer is through, said control parameter remains outside said pre-set tolerance range to allow a neural network to be realized with an excellently high integration density (col. 2, lines 65-68 and col. 3, lines 1-2).

36. Claims 11-13 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sheirik in view of U.S. Patent No.: 6,582,841 (hereinafter Okamoto).

37. As per claim 11, Sheirik discloses a chemical control system (col. 1, lines 20-23) substantially the same as claimed but does not expressly teach a controlled system comprises at least one fuel cell.

Okamoto teaches a controlled system comprises of at least on fuel cell (col. 1, lines 8-11 and Fig. 1, element 20).

Therefore, it would be obvious to a person of ordinary skill in the art at the time of the applicant's invention to modify the teaching of Sheirik include a controlled system that comprises of at least one fuel cell to manufacture fuel cells having properties which are exactly at the aim values (Sheirik: col. 1, line 68 and col. 2, lines 1-3).

38. As per claim 12, Sheirik as set forth in claim 11 discloses at least one control parameter is represented by the voltage (Fig. 20, element 2002) generated by said at least one fuel cell (col. 7, lines 32-34).

39. As per claim 13, Sheirik as set forth in claim 11 discloses the characteristic parameters of the controlled system are chosen from the group consisting of:

the current (Fig. 20, element 2002) generated by said at least one fuel cell,

the quantity of air (Fig. 20, element 2002) supplied to said at least one fuel cell, and

the temperature (Fig. 20, element) of said at least one fuel cell (col. 7, lines 32-34).

40. As per claim 20, Sheirik as set forth in claim 14 does not expressly teach a system comprises a method for controlling at least one fuel cell.

Okamoto teaches a controlled system comprises of at least on fuel cell (col. 1, lines 8-11 and Fig. 1, element 20).

Therefore, it would be obvious to a person of ordinary skill in the art at the time of the applicant's invention to modify the teaching of Sheirik include a controlled system that comprises of at least one fuel cell to manufacture fuel cells having properties which are exactly at the aim values (Sheirik: col. 1, line 68 and col. 2, lines 1-3).

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following references are cited to further show the state of the art with respect to control systems with neural networks and fuel cells.

U.S. Patent No.: 5,142,612 discloses a system for monitoring and controlling a manufacturing process with neural networks.

U.S. Patent No.: 5,282,261 discloses a system for monitoring and controlling a manufacturing process with neural networks.

U.S. Patent Publication No.: 2005/0008905 discloses a method and apparatus for regulating electrical power output of a fuel cell.

"Battery Pack State of Charge Estimator Design using Computational Intelligence Approaches" discloses a neural network based adaptive estimator.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer L. Norton whose telephone number is 571-272-3694. The examiner can normally be reached on 8:00 a.m. - 4:30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anthony Knight can be reached on 571-272-3687. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Anthony Knight
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